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ART. I.—*Transactions of the American Philosophical Society, for promoting useful Knowledge.* Vol. II. New Series. A. Small. Philadelphia. 4to. pp. 503.

THE American Philosophical Society was instituted at Philadelphia, about eighty years ago, chiefly through the instrumentality of Dr Franklin. The elevated genius and ardent love of knowledge, which were among the rare traits of this great philosopher and statesman, impelled him by all practicable means not only to discover, but to communicate truth, not only to develop the principles of nature and the laws of social intercourse, but to make his acquisitions useful to the greatest possible extent. Franklin was truly the friend of his species, and believed no labor without its reward, which taught men the art of understanding and improving their condition, or, in other words, the art of securing their independence, prosperity, and happiness, by their own exertions. All his researches in physical science, politics, morals, and the economy of life, aim at utility; he employed philosophy as an instrument of good to mankind, and converted knowledge to its proper ends. In these intellectual habits of Franklin originated the Philosophical Society at Philadelphia.

For several years the Society was little more, than an association of scientific gentlemen, for the purpose of aiding one another in their pursuits by conversation and concert. The meetings of the Society were also frequently interrupted

during the revolutionary war. But the activity of its members did not cease, and their labors have been recorded in successive volumes of Transactions. In the present article our attention is drawn to the volume last published, being the eighth from the beginning, and the second of the new series. The Society ranks among its numbers some of the most distinguished men of letters and science in this country and in Europe, and many of the contributions to its Transactions are from high sources. The meetings are held in a handsome and commodious building in Philadelphia, which belongs to the Society, and which contains a library of about six thousand volumes, and various specimens of natural history. The catalogue of this library, formed under the immediate direction of Mr Duponceau, is one of the best, in the methodical and philosophical principles of its arrangement, that we have ever seen. The original purpose of the Society was the cultivation of the physical and exact sciences, and to this it was long confined. The plan has recently been enlarged, by embracing history, moral science, and general literature. The standing committee, appointed for this department, published six years ago a separate volume, with encouragement that another would in due time appear. We hope the time will soon arrive. This new department reaches to so wide a compass of interesting inquiry, that it cannot fail to enlist more able minds in the cause of the Society, and thereby increase its dignity and extend its usefulness. The presidents have been successively, Benjamin Franklin, David Rittenhouse, Thomas Jefferson, Caspar Wistar, Robert Patterson, and William Tilghman, the present distinguished Chief Justice of the Commonwealth of Pennsylvania.

This Society, not more on account of its antiquity and the high character of its members, than of its objects and its past labors, justly claims the respect of all lovers of science, and friends of improvement in this country. Amidst the numerous societies, which are almost daily shooting up around us, with pompous titles and long lists of officers, with constitutions, and bylaws, and boasts of great projects in hand, but which sink away and go out of sight, after a little vain bustling on the part of a few zealous candidates for the offices at the next election, when their names may appear at full length as part of the news of the day, or perhaps at the bottom of

a report detailing with great formality, what the society intends to do; we say, in the midst of all this empty parade and pretence, it is with sincere pleasure that we can look up to the Philosophical Society, and the Academy of Natural Sciences, in Philadelphia, as institutions creditable to themselves and the country, by the dignity of their objects, and by the steady and substantial efforts with which these objects are prosecuted. A very few others may be entitled to a similar preference, but the number is exceedingly small. We could wish, indeed, that our own American Academy, whose doings have been so laudable in years gone by, would more frequently give other tokens of its existence, than the annual list of new members published in the newspapers. We do not object to literary and scientific associations; on the contrary, we believe they may be made the means of vast improvement to individuals and to the community; but we confess that we have no patience with the growing fashion of building up these associations, and enlarging them, merely for a noise and a puff, as a convenient mode by which a number of persons may keep each other in countenance in making pretensions, which, singly, they would never dare to make, and which, under no circumstances, can they ever realise. The whole business is arrant quackery, and although it breaks no bones, nor administers any poison, yet it deceives the public, and as far as any effect is produced, it is to bring literature and science into disrepute.

The present volume of Transactions contains several important papers, some of which are so purely scientific, that we should fail in any attempt to analyse them, were such an analysis within the scope of our journal. Three or four may be selected, however, on which we trust a few observations will not be unacceptable to our general readers. The paper by Dr Drake, containing a *Geological Account of the Valley of the Ohio*, is curious not more for its facts, than for the ingenious speculations of the author, in attempting to account for certain geological phenomena in the western country. His paper is accompanied with a profile of the valley of the Ohio, running transversely across the river at Cincinnati, and indicating the alluvial formations on each bank of the river at that place.

The banks of the Ohio, like those of the Connecticut, and in fact we believe of most of our rivers, are composed of two or three platforms, or distinct plains, rising one above another by elevations varying from ten to fifty feet. These platforms are alluvial, extending from hill to hill across the valley through which the river finds its passage, and have evidently been deposited at some former period by the waters of the river. But it is common for the highest platform, or that bordering on the mountainous or hilly formation, to be sixty, eighty, and even a hundred feet above the highest level to which the river now rises. The necessary result is, that the quantity of water which flowed in the river, when these deposits were made, was such as to fill the whole valley to that elevation, and as the water for some cause became diminished in quantity, it gathered itself into a narrower channel, and left the dry soil on its margin. One of the most singular circumstances attending this diminution of the water, is, that it seems to have been done at certain periods, and thus to have formed the regular succession of ascents and plains mentioned above. Had the subsiding of the water been uniform, the surface of the deposit would now be a gradual slope, from the base of the hills to the margin of the river. As these platforms and ascents are commonly two or three in number, on the borders of the large rivers east and north of the Mississippi, and we suppose of the Rocky Mountains, it is reasonable to refer them all to a cause acting at the same time, and to draw the conclusion, that the northern continent of America has at two or three particular seasons undergone signal revolutions, either by internal convulsions, or by the sinking of a large extent of country now occupied by the Atlantic Ocean, and thus leaving a space to be filled by the waters of the valleys, which have since dwindled into comparatively small streams. There is a difficulty, however, about the whole matter, when we ask how these immense rivers were supplied in former times, since, by the ordinary process of nature in evaporation, rains, and internal circulation, no more water is produced than enough to sustain the rivers in their present diminished channels.

Dr Drake does not puzzle himself, nor his readers, with speculations on these general bearings of the subject, but his investigations are chiefly confined to the valley of the Ohio.

He first inquires into the cause of the great excavation through which this river runs, and gives it as his opinion, that this broad valley, as well as that of the Mississippi, was originally caused by the sinking of a region now covered by the Gulf of Mexico, and thus giving a southerly current to the waters, which before that time overspread the regions at the north. In this way the great valleys were formed by the strong currents and perpetual abrasion of the waters. Another mode of accounting for the same thing would be to suppose, that the elevations and depressions of the surface, or the mountains and valleys, were produced by some violent convulsion within, and that the waters sought a passage in the most depressed parts. From various geological appearances Dr Drake thinks it quite certain, that such could not have been the origin of the great valleys and elevations of the west, although he allows that on the south of the Ohio river, in some parts of Kentucky, there are *ravines* and abrupt eminences, which indicate the action of some violent cause beneath. In modern times the river has become contracted in width, and the bed of its channel deepened. This channel is now worn many feet below the bottom of the alluvial deposits on its margin. It is continually increasing in depth, though Dr Drake says very slowly, as the current at the bottom of the river is always much less rapid than at the surface, except at the time of floods or freshets. This is easily ascertained in the summer season, when the water of the river is clear, and the bottom can be distinctly seen. Accumulations of light particles are found resting there, when the current at the surface is so strong, as instantly to carry away much heavier substances. It follows that the attrition of the water at the bottom is much less, than would be apprehended from its velocity above, and that the process of deepening the channel is extremely slow.

Dr Drake accounts for some remarkable geological appearances in the western country in a manner so curious and plausible, that we shall present his views in his own language. After describing the gravelly substances, or *debris*, which occur in the regions of the Ohio river, and which are found of a similar composition and character, as he says, all over the western and northern parts of the United States, he proceeds as follows.

‘We are hence, I think, justified in the conclusion, that its origin was in the north, and that it was brought and deposited on the surface of this country by currents, which in ancient times flowed from beyond the Lakes to the Gulf of Mexico, and of which it may be regarded as the sign and the effect.

‘A more recent formation, than many of the alluvial beds contained within the limits just defined, is the stratum of loam spread over the surface of our hills and valleys in an *overlaying* position. This appears to be the same, that in the north of Europe is denominated *geest*, and which Mr De Luc considers as the last deposit made by the sea before its final retreat.’ ‘The deposition of the *geest* seems to have been the last operation, which the waters of the north performed upon this region, and was of course subsequent to the excavation of the valleys, as no deposit could have remained upon their acclivities, while the agent which formed them continued its action. To this formation belong the great blocks of foreign primitive transition, and old floetz rocks, which have excited in travellers so much astonishment, and which, in one point of resemblance at least, approximate the region south of Erie, Huron, Michigan, and other lakes, so closely to that which stretches from the southern shores of the Baltic Sea.

‘These masses in the neighborhood of this place, [Cincinnati,] are for the most part solitary, but in the interior of the State it is not uncommon to find them grouped into heaps, which are slightly covered with soil; and it is, I suspect, an aggregation of this kind, on one of the Islands of Lake Huron, that a British officer mistook for granite *in place*. The size of these masses extends from that of gravel and pebbles to the diameter of eight or ten feet. The larger blocks are frequently found *upon* the old alluvial plains, but never, that I have understood, *within* them. Their geographical range is over the same region with the smaller foreign *debris* of our valleys, but more limited to the south west. I have never seen a single block on the opposite side of the Ohio, and am not informed that any have been observed lower than the thirtieth degree of latitude.

‘I do not entertain a doubt, that these fragments were enveloped in large fields of ice in a region far beyond the Lakes, and floated hither by the same inundations, that brought down and spread over the surface of this country the *geest* in which they are imbedded. In the southern parts of this formation they are not found; but this should be attributed to the influence of the climate. The ice, to which they were attached, could not of course pass a certain latitude; and from the great increase of these masses as we advance towards the north, it would seem that many of the icebergs suffered dissolution long before they arrived at this *maximum*. Future

observers will no doubt trace them to their parent strata in the arctic regions, as Von Buck has traced those, which are lodged on the shores of the Baltic. The ice islands of the Atlantic ocean may reasonably be supposed to bring down, and deposit on its bed in the Temperate zone, primordial masses similar to those spread over some parts of this and the European continent. These islands are, I believe, not often seen further south than the fortyfirst degree, near two degrees north of their southern boundary here. This is probably attributable to the Gulf Stream; but for which, the larger tracts of ice would undoubtedly attain as low a latitude as the southern limits of the primitive blocks in this country; and hence a probable conclusion may be drawn, that the temperature of the northern hemisphere has undergone but little change, since the remote epoch when this part of the continent was for the last time subjected to inundation.'

From these facts, and this mode of reasoning, it would seem, that at some former period the ocean flowed over this continent with a current setting from north to south, and that the present features of the earth's surface in these regions have taken their shape and character from the action of this cause. Mr Hayden has pursued the same inquiry, in regard to the rivers and soil on the Atlantic coast, and has come to the same result. The only additional proof, now required, is that mentioned by Dr Drake as having been applied by Von Buck. Let it be established, by observation, that the rocky fragments, deposited throughout the alluvial formation of this country, are of precisely the same kind as the primitive masses in the polar regions of the American continent, and the demonstration will approach a degree of certainty, which will be satisfactory to most minds.

The fifth article in the volume is one of a good deal of interest and value. It contains a series of observations, by Mr John Hamilton, on the *Winds, Currents, the Gulf Stream, and the Temperature of the Air and Water in the North Atlantic Ocean*. The tables are skilfully constructed, and the observations carry with them every appearance of accuracy. These latter were made during twentysix voyages across the Atlantic, chiefly between Philadelphia and Liverpool. It was Mr Hamilton's object to ascertain, whether any substantial results could be derived from a course of observations of this sort, which should be of uniform and permanent advantage to navigators. In summing up the

matter, however, he seems not to be very sanguine, although he clearly shows, that a methodical use of the thermometer, in determining the temperature of the water, will enable the mariner infallibly to tell, after a little practice, when he is in a current, or on soundings. He says that currents at sea are usually from two to four degrees warmer, than the water out of the current. On soundings the water is always warmer than off, although the temperature varies more than in currents, as it depends much on the depth of the water, and the position of the coast. Along the American shore the difference of temperature varies also with the seasons, it being less in summer than in the other seasons.

In navigating the Gulf Stream the thermometer is of essential use. The difference between the temperature on the north side of this current and the sea out of it averages ten degrees; on the south side it is not so much, but never less than five degrees. In summer it is less than in winter. By knowing these data, and by using the thermometer three or four times a day, the navigator may always determine when he enters the Gulf Stream. It is not easy to define the exact limits of this stream, because it is more or less affected by the winds; and after it passes the Grand Bank of Newfoundland it is divided into several branches, the main current proceeding to the south east, and the others to the east and north east. There are counter currents on each side of the Gulf Stream, but Mr Hamilton thinks the temperature of these not to be perceptibly different from that of the stream itself. The thermometer, therefore, will not indicate the counter currents; but this is not of much moment, compared with the great utility of the instrument in determining the presence of the stream itself, which, on account of the variableness of the current produced by winds and other causes, is not easy to be ascertained by any mode of calculation. Mr Hamilton says, that many navigators who profess to use the thermometer, profit little by it, because they do not begin their observations till they suppose themselves approaching the Gulf Stream, or soundings, and then, if it happens that they have entered either, the temperature is changed from that of the ocean, and they have no means of an accurate comparison. To be of any use, the observations should be daily, and regular. Were every experienced and intelligent navigator to take the pains,

which Mr Hamilton has done in forming his tables, we doubt not that a series of facts would be collected, which would greatly facilitate the navigation not only of the Atlantic Ocean, but of other parts of the world.

We have next in order a very long paper on the *Survey of the Coast of the United States*, by Mr Hassler, making nearly one half of the volume. The singular result of the efforts of the government to survey the coast of the United States, has been a source of serious regret to many, and of wonder to all, who have known anything of the subject. How many thousands have been expended in purchasing instruments, retaining engineers, forming splendid projects, and preparing for great undertakings, we shall forbear to inquire. It is well known, that no visible thing has been done, and that we yet labor under the disgrace of being obliged to resort to the British charts of our coast, as the best that have been made. Holland's Charts, published in England, at the commencement of the Revolution, or copies from them, are still the guides to our seamen, when they would ensure accuracy and safety. The soundings are corrected in Blunt's charts, but the topographical delineations are nowhere executed with so much fidelity as in the old English surveys; and even in the late war, the inhabitants of the coast were frequently surprised at seeing the British vessels of large size sailing boldly into passages and inlets, where no American had ever ventured with the lightest coasting craft. Nothing would contribute more to the success and security of our commerce, than a thorough and minute survey of the coast; on nothing could public money be more profitably, or creditably, expended; and at no time can it be done with more ease and convenience, than at the present. To defer it longer is but to perpetuate the reproach, which past neglect has so justly drawn upon the nation. Much might be said on this subject, in relation to what has been attempted heretofore, to the projects that were in contemplation, and to the history and fate of the elegant and costly instruments, which were procured in Europe, but which are now neglected and useless.

There is a memoir in the volume, written in French, by Mr Jules de Wallenstein, containing an account of *Meteorological Observations* made by him at Washington, during the

space of one year, from April 1823 to April 1824. Tables of results are also added to the memoir. Whether we regard the accuracy of the instruments, or the scientific skill of the author in using them, we presume Mr de Wallenstein's observations may justly be ranked among the best, which have been made in this country. His instruments were selected by himself in Europe, and constructed by the most eminent artists. They form a complete apparatus for observing the temperature, pressure, and moisture and dryness of the atmosphere. He begins his paper by describing these instruments, and his mode of using them. His barometer was constructed by Fortin, on the most approved principles, and was of the same kind as that employed in the Royal Observatory in Paris; his hygrometer was on the plan of Saussure; he had two thermometers by Lerebours and Fortin, and one by Troughton with Fahrenheit's scale. These are all briefly described.

The author's most curious remarks are those on the *horary variations* of the barometer. He gives a concise view of this interesting subject, as it has been treated by Humboldt, Godin, La Condamine, and others. It is not of a nature to be discussed in this place, but we agree with Mr de Wallenstein, that it well deserves the attention of philosophers, and of those who travel for improvement in natural science. He thinks these variations of the barometer are in some way linked with other appearances, the causes of which are yet among the secret things of nature, and supposes it probable, that 'good observations on the periodical variations of the magnetic needle, electricity, and the barometer, made by such men as Humboldt, La Condamine, Mutis, and Buch, might lead to the discovery that there is some connexion between these phenomena, or at least that one may be explained by another.' Whatever may be thought of this suggestion, it must be confessed, that these topics offer a wide and unexplored field for philosophical research. It will be at once perceived, that the influence of such discoveries must be very great, when it is considered how universal are these phenomena and their causes, and how completely they pervade all parts of physical nature. Nor does the progress of these discoveries seem so difficult, as might at first be imagined, since, as the author remarks, Mutis has already ascer-

tained a connexion between the horary variations of the barometer and the conjunctions and oppositions of the Moon, and La Place has calculated the influence, which the Sun and Moon may exercise on our atmosphere.

Mr de Wallenstein holds a high station in the Russian embassy to this country, and we will not conceal, that it is gratifying to our national feelings, that a gentleman of his character and qualifications, not more distinguished by his great and varied attainments, than by the urbanity of his manners, should take so lively an interest in the advancement of science among us, as well as in the history and progress of our institutions.

The last paper we shall notice is that on the *Language of the Berbers*, which is curious for the novelty of its facts, and its historical hints. It contains two parts; first, a short dissertation by that profound philologist, Mr Duponceau; and, secondly, letters to this gentleman from Mr Shaler, Consul General of the United States at Algiers. ‘The Berbers,’ says Mr Duponceau, ‘are a white race of men, who inhabit the chain of Mount Atlas, and extend to the borders of the desert of Sahara. To the north of them are the Bedouin Arabs, and still farther north are the Moors, whose dominions line the south western coast of the Mediterranean. The country of the Berbers is considered as included within those dominions, but the Moorish governments have not yet succeeded, nor probably ever will succeed, in reducing these tribes to a state of complete subjection.’ From recent observations it has been supposed, that these people speak an original language, peculiar to itself in its construction and idiom, and that dialects of the same language prevail quite across the northern regions of Africa, from the Cape de Verd Islands almost to the Red Sea. Mr Marsden, and some other writers, have been of opinion, that the Berber language is a remnant of the old Punic. Vater considers it the Numidian, corrupted by an intermixture of Arabic, and other idioms. Mr Duponceau is decidedly against the Punic origin, and is disposed to wait for further information, before he forms an opinion in regard to the other theory. Mr Shaler’s communications throw some light on the subject. This gentleman inclines to the belief, that the language is an original one. We quote below an extract from

one of his letters. The *Kabyles*, of whom he speaks, are a race of Berbers, residing on the southern borders of Algiers and Tunis.

‘The Kabyles of north Africa,’ says Mr Shaler, ‘are a white people; they invariably inhabit the mountains, where they maintain their independence, and probably have never been completely subjected by any of the conquerors, who have at different periods overrun this country. Each mountain usually forms an independent state, and they are often engaged in petty wars with each other, which are fomented by the Turks, who thereby sometimes succeed in extorting from them a precarious tribute; but since the days of Barbarossa, although some may have been exterminated, none have been entirely subjected to Turkish domination. Although the Kabyles are a very ingenious people, with the most tractable and social dispositions, they have not the commercial propensities of the Moors and Arabs. Independence appears to be the greatest object of their existence, as with it they cheerfully endure poverty in the most rigorous climates. Such, at least, is their actual political condition, and with such unequivocal marks of originality of character, I think they may be regarded as a safe depository of a language.

‘From various causes, they may have thrown off their surplus population amongst their neighbors, and even sent out colonies in a country, that does not appear to have been ever properly settled, yet under such circumstances, having no distinct religion of their own, they might easily enough accept that of their neighbors, where nothing was hazarded by it. At this day the Kabyles are regarded as very barbarians, both in the theory and practice of Islamism. There is a foundation in Algiers expressly for their instruction, which they receive *gratis*. From what is related of the Tuarycks by Hornemann and Lyon, they are also a white people, very numerous, brave, warlike, and of an independence of manners and deportment, that displays a remarkable contrast with the servility in practice at the court of Fezzan. They inhabit vast regions intersected by deserts, have little knowledge of Islamism beyond its forms, and in several districts they are pagans. It is not therefore a great stretch of credulity to believe, that the Tuarycks are also an original unconquered people, and the depositaries of an ancient language, which being identified with that of the Kabyles, leads to the conclusion that it is one of the ancient languages of the world, which has withstood the conquests of the Phenicians, of the Romans, of the Vandals, and of the Arabs. As I have the authority of the learned Shaw for believing, that this language is radically different from the Hebrew and the Arabic, I think the premises justify this conclusion, though it would certainly be more interest-

ing to discover the language of Sanchoniathon, than the Numidian. This question, however, must be left to the decision of the learned, when its vocabulary is made more complete, and a greater insight is obtained into its grammatical forms?

Mr Shaler has obtained partial vocabularies of the language of the Kabyles, taken by a Jewish interpreter, and a Swedish gentleman, which are printed in this paper, and compared with Dr Shaw's vocabulary. The investigation will be pursued, as opportunities occur of becoming better acquainted with the language of these people. Several particulars illustrating this subject, and confirming the suggestions in the above extract, may be expected in Mr Shaler's work on Algiers, which has already been promised to the public.

On the whole we cannot doubt, that the present volume of Transactions will fully sustain the reputation, which the Society has acquired by those it has formerly published. The first paper, containing a *Description of Insects inhabiting North America*, by Mr Thomas Say, occupies about one fifth of the volume, and the name of the author, in connexion with this department of physical science, speaks sufficiently for the character of his performance. There are other articles on topics of mineralogy, chemistry, botany, the mathematics, and one on the anatomy and physiology of the Alligator of North America. An obituary notice of the late president, Robert Patterson, is prefixed to the volume.

The best historical account of the American Philosophical Society, which we have seen, is contained in the appendix to Mr Walsh's Appeal.

ART. II.—*Hadad, a Dramatic Poem*. By JAMES A. HILLHOUSE, Author of 'Percy's Masque,' and 'The Judgment.' New York. E. Bliss and E. White. 1825. 8vo. pp. 208.

THE scene, in which this poem is laid, is not such a one as poetry has often inclined to select, though none could be found, as we apprehend, more appropriate to the exercise of its powers. Indeed we are surprised, that the ancient Jewish